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E-mail

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E-mail, or **email**, is short for "electronic mail" (as opposed to conventional mail, in this context also called snail mail) and refers to composing, sending, and receiving messages over electronic communication systems. Most e-mail systems today use the Internet, and e-mail is one of the most popular uses of the Internet.

E-mail before the Internet

Despite common belief, e-mail actually pre-dates the Internet; in fact, existing e-mail systems were a crucial tool in creating the Internet.

E-mail started in 1965 as a way for multiple users of a time-sharing mainframe computer to communicate; although the exact history is murky, among the first systems to have such a facility were SDC's Q32 and MIT's CTSS.

E-mail was quickly extended to become *network e-mail*, allowing users to pass messages between different computers. The early history of network e-mail is also murky; the AUTODIN system may have been the first allowing electronic text messages to be transferred between users on different computers, in 1966, but it is possible the SAGE system had something similar some time before.

The ARPANET computer network significantly increased the

popularity of e-mail. There is one report [1] which indicates experimental inter-system e-mail transfers on it shortly after its creation, in 1969. The use of the "@" sign to separate the names of the user and their machine, was initiated by Ray Tomlinson in 1972; the common report that he "invented" email is an exaggeration, although his early e-mail programs SNDMSG and READMAIL were very important.

Since not all computers or networks were directly inter-networked, e-mail was forwarded between sites using protocols such as UUCP, and e-mail addresses had to include the "route" of the message, that is, a path between the computer of the sender and the computer of the receivers. E-mail could be passed this way between a number of networks, including the ARPANET, BITNET and NSFNET, as well as to hosts connected directly to other sites via UUCP.

The route was specified using so-call "bang path" addresses, specifying hops to get from some assumed-reachable location to the addressee, so called because each hop is signified by a "bang sign", i.e. "!". Thus, for example, the path ...!bigsite!foovax!barbox!me directs people to route their mail to machine bigsite (presumably a well-known location accessible to everybody) and from there through the machine foovax to the account of user me on barbox.

Before auto-routing mailers became commonplace, people often published compound bang addresses using the { } convention (see glob) to give paths from several big machines, in the hopes that one's correspondent might be able to get mail to one of them reliably (example: ...!{seismo, ut-sally, ihnp4}!rice!beta!gamma!me). Bang paths of 8 to 10 hops were not uncommon in 1981. Late-night dial-up UUCP links would cause week-long transmission times. Bang paths were often selected by both transmission time and reliability, as messages would often get lost. See the network and sitename.

Modern internet e-mail

Nowadays, almost all e-mail is delivered directly to Internet-connected hosts, using DNS MX records and SMTP (Simple Mail Transfer Protocol). Very few modern servers allow routing (automatic or manual) any more due the potential for abuse by people sending unsolicited bulk email. Those that do allow it are called open relays.

A modern Internet **e-mail address** is a string of the form *jsmith@corporation.com*. It should be read as "jsmith **at** corporation.com". The first part is the username of the person, and the second part is the hostname of the computer in which that person has

an e-mail account.

The format of internet e-mail messages is defined in RFC 2822. Prior to the introduction of RFC 2822 the format was described by RFC 822.

Internet e-mail messages typically consist of two major components:

- o Headers - Message summary, sender, receiver, and other information about the e-mail
- o Body - The message itself, usually containing a signature block at the end

The headers usually have at least four fields:

1. From - The e-mail address of the sender of the message
2. To - The e-mail address of the receiver of the message
3. Subject - A brief summary of the contents of the message
4. Date - The local time and date when the message was originally sent

Note however that the "To" field does not necessarily have the email address of the recipient. The information supplied in the headers on the recipients computer is similar to that found on top of a conventional letter. The actual information such as who the message was addressed to is removed by the mail server after it assigns it to the correct user's mailbox.

Other common fields include:

1. Cc - Carbon copy (because typewriters used carbon film to copy what was written on them)
2. Bcc - Blind carbon copy (the recipient of this copy will know who was in the To: field, but the recipients cannot see who is on the Bcc: list)
3. Received - Tracking information generated by mail servers that have previously handled a message
4. Content-Type - Information about how the message has to be displayed, usually a MIME type

Messages and mailboxes

Messages are exchanged between hosts using the Simple Mail Transfer Protocol with software like Sendmail. Users download their messages from servers usually with either the POP or IMAP protocols, yet in a large corporate environment users are likely to use some

proprietary protocol such as <u>Lotus Notes</u> or <u>Microsoft Exchange Server</u>'s.

Mails can be stored either on the <u>client</u> or on the <u>server</u> side. Standard formats for mailboxes include <u>Maildir</u> and <u>mbox</u>. Several prominent e-mail clients use their own, proprietary format, and require conversion software to transfer email between them.

E-mail content encoding

E-mail is only defined to carry 7-bit <u>ASCII</u> messages. Although many e-mail transports are in fact "8-bit clean", this cannot be guaranteed. For this reason, e-mail has been extended by the <u>MIME</u> standard to allow the encoding of binary <u>attachments</u> including images, sounds and <u>HTML</u> attachments.

Spamming and e-mail worms

The usefulness of e-mail is being threatened by two phenomena, <u>spamming</u> and <u>e-mail worms</u>.

Spamming is unsolicited commercial e-mail. Because of the very low cost of sending e-mail, spammers can send hundreds of millions of e-mail messages each day over an inexpensive Internet connection. Hundreds of active spammers sending this volume of mail results in many computer users receiving tens or even hundreds of junk e-mails each day.

E-mail worms use e-mail as a way of replicating themselves into vulnerable computers. Although the first e-mail worm (the <u>Morris worm</u>) affected early UNIX computers, this problem is today almost entirely confined to the <u>Microsoft Windows</u> oprerating system.

The combination of spam and worm programs results in users receiving a constant drizzle of junk e-mail, which reduces the usefulness of E-mail as a practical tool.

A number of <u>technology-based initiatives</u> mitigate the impact of spam. <u>Congress</u> has also passed a law, the <u>Can Spam Act of 2003</u>, to regulate such e-mail.

Further Reading

- ◦ Katie Hafner, Matthew Lyon, *Where Wizards Stay Up Late: The Origins of the Internet* (Simon and Schuster, 1996) also covers the early history of e-mail

See also:
- E-mail art
- E-mail social issues:
  - netiquette
  - Trimming
  - Internet humor
  - Internet slang
  - spam
  - virus.
- Clients and servers:
  - email client
  - mail transfer agent
  - webmail / HTMLmail
  - branded email
- Emailing list:
  - electronic mailing list
  - mailing list archive
- e-mail address
- Free email:
  - Hotmail.com webmail

External links

- The History of Electronic Mail is a personal memoir by the implementer of one of the first e-mail systems
- Michael A. Padlipsky, *And They Argued All Night...* is an alternative personal recollection of the origins of network e-mail
- The First E-Mail Message is an article about the history of network e-mail; contains some errors

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Computer software

From Wikipedia, the free encyclopedia.

Software is a generic term for organized <u>collections</u> of <u>computer</u> <u>data</u> and <u>instructions,</u> often broken into two major categories: <u>system</u> <u>software</u> that provides the basic non-task-specific functions of the computer, and <u>application software</u> used to accomplish specific user-oriented <u>tasks</u>.

System software

<u>System software</u> is responsible for controlling, integrating, and managing the individual <u>hardware</u> components of a <u>computer system</u> so that other software and the users of the system see it as a functional unit without having to be concerned with the low-level details such as transferring <u>data</u> from <u>memory</u> to <u>disk,</u> or <u>rendering</u> text onto a <u>display</u>. Generally, system software consists of an <u>operating system</u> and some fundamental utilities such as disk formatters, file managers, display managers, text editors, user authentication (login) and management tools, and networking and device control software.

Application software

<u>Application software,</u> on the other hand, is used to accomplish specific <u>tasks</u> other than just running the <u>computer system</u>. Application software may consist of a single <u>program,</u> such as an <u>image viewer;</u> a small collection of programs (often called a <u>software package</u>) that

work closely together to accomplish a task, such as a <u>spreadsheet</u> or text processing system; a larger <u>collection</u> (often called a <u>software suite</u>) of related but independent programs and packages that have a common <u>user interface</u> or shared <u>data format</u>, such as <u>Microsoft Office</u>, which consists of closely integrated <u>word processor</u>, <u>spreadsheet</u>, <u>database</u>, etc.; or a <u>software system</u>, such as a database management system, which is a collection of fundamental programs that may provide some service to a variety of other independent applications.

Software creation

Software is created with <u>programming languages</u> and related utilities, which may come in several of the above forms: single programs like script <u>interpreters</u>, packages containing a <u>compiler</u>, <u>linker</u>, and other tools; and large suites (often called <u>Integrated Development Environments</u>) that include <u>editors</u>, <u>debuggers</u>, and other tools for multiple languages.

Software patents

The issue of <u>software patents</u> is very controversial, since while <u>patents</u> protect the ideas of "<u>inventors</u>", they are widely believed to hinder <u>software development</u>.

Related articles

- <u>Computing</u>
- <u>Computer programming</u>
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  - <u>Text editors</u>
  - <u>Compilers</u>
  - <u>Algorithms</u>
  - <u>Color management</u>
  - <u>Software development process</u>
  - <u>Software development tools</u>
  - <u>Software optimization</u>
  - <u>Application Programming Interface (API)</u>
- <u>Software packages</u>
  - <u>Graphics programs</u>
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    - <u>Raster graphics</u>
    - <u>Vector graphics</u>
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  - <u>Business software</u>

- - Customer Relationship Management
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    - Pretty Good Privacy
    - GNU Privacy Guard
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Cookie

A cookie is a file sent to a web browser by a web server that is used to record one's activities on a website. For instance, when you buy items from a site and place them in a so-called virtual shopping cart, that information is stored in the cookie. When the browser requests additional files, the cookie information is sent back to the server. Cookies can remember other kinds of personal information, such as your password, so you don't have to re-enter it each time you visit the site; and your preferences, so the next time you return to a site, you can be presented with customized information. Some people regard cookies as an invasion of privacy; others think they are a harmless way to make websites more personal.

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